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Integration segment

Summary record of the 23rd meeting
Held at Headquarters, New York, on Wednesday, 2 May 2018, at 3 p.m.

President: Ms. King (Vice-President) ..... (Saint Vincent and the Grenadines)

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Session 4: *Panel discussion on "National strategies for resilience"*

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18-07009 (E)

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In the absence of Ms. Chatardova (Czechia), Ms. King (Saint Vincent and the Grenadines), Vice-President, took the Chair.

The meeting was called to order at 3.10 p.m.

Agenda item 8: Integration segment (*continued*)

Session 4: *Panel discussion on "National strategies for resilience"*

1. **Mr. Allen** (Chief of the United Nations Volunteers Office in New York), moderator, said that resilience was a vital part of the work of United Nations Volunteers programme, which deployed 109 million full-time volunteers worldwide in support of system-wide efforts to implement the 2030 Agenda for Sustainable Development. Technology and innovation were fundamental to resilience, as was human behaviour. Ensuring connections to citizens via social relationships was a key factor in many disasters, and a vital component of how citizens connected to States and to one another. Research from the latest State of the World's Volunteerism report had demonstrated that any strategy for resilience must embed the idea of engagement by people, and volunteerism offered one pathway to that end. Volunteer-led structures were close to issues on the ground and could be adjusted as necessary. The panel discussion would shed light on how countries had formulated resilience strategies and policies to mitigate their vulnerabilities; what challenges they encountered in formulating those strategies; and what the Council could do to support countries in leveraging technology and innovation and catalysing further means to implement national resilience strategies.

2. **Mr. Ovink** (Special Envoy for International Water Affairs of the Netherlands), panellist, accompanying his remarks with a digital slide presentation, said that resilience meant something different to each of the four constituent countries of the Kingdom of the Netherlands. To a small island developing State like Sint Maarten, resilience meant building back better in a post-hurricane context, whereas for the Netherlands itself, a low-lying delta country, resilience meant working with water rather than against it, and building sustainably around it.

3. A proactive approach must be taken to build resilience, instead of a failure to respond or a response only in the aftermath of a disaster. The pillars of such an approach were commitment from all parts of society, cross-cutting efforts, collaboration, consistency and capacity-building. Those five pillars provided the answer to the question of how to build resilience.

4. The devastation wrought by two category five storms in the Caribbean in 2017 made it clear that islands like Sint Maarten must be built back better, not merely rebuilt. The five pillars had provided the context for a way forward that focused on resilience. For example, the Government of Sint Maarten, in collaboration with the World Bank, had set up a one-donor trust fund in the amount of $500 million. It had also decided to collaborate with several stakeholders on the development of a national recovery and resilience plan. Furthermore, to facilitate cross-cutting efforts, the Government had partnered with the United Nations Development Programme (UNDP) Centre of Excellence for the Sustainable Development of Small Island Developing States to organize a multi-stakeholder "hackathon" event, which had yielded 21 innovative project ideas in areas ranging from sustainable tourism to waste management. To ensure consistency, a follow-up meeting had been planned, a website titled "Build Back Better SXM" had been established and a taskforce of local "build back better" champions had been created with the support of an international advisory board. The follow-up efforts monitored progress and provided an opportunity to develop local capacity to apply for funding and focus on implementation.

5. Efforts to foster resilience in Sint Maarten would be in vain, however, without a broader regional approach, given the economic and social interconnectedness of Caribbean islands; hence the need to scale up and replicate those efforts to promote regional resilience. To that end, the high-level pledging conference organized by the Caribbean Community and UNDP attested to the financial and moral commitment of countries to an integrated approach. The follow-up conference to be hosted by Belgium, Antigua and the UNDP Centre of Excellence in Aruba exemplified collaboration across regions to move the resilience agenda forward. The wide range of stakeholders brought together to seek inspiration and generate funding capacity demonstrated the cross-cutting nature inherent to the effort. Ensuring the consistency of international action was one of the main aims of organizing a follow-up conference. The conference itself had contributed to capacity-building by promoting disaster risk management, building partnerships, exchanging lessons learned and shedding light on climate-resilient infrastructures.

6. Measures to promote resilience in the Netherlands, where living and working with water had been a hallmark of life and culture for centuries, included the Delta Programme. The Government of the Netherlands had demonstrated its commitment to resilience by enacting the Delta Law and establishing a dedicated

planning and response fund. The appointment of a Delta Commissioner helped to facilitate cooperation among all stakeholders, including regional water authorities, local and national governments and businesses. The initiative built on the centuries-old culture of living with water. For instance, at the new river bypass near Nijmegen, improved flood protection had created conditions conducive to better recreation and urban development. Adaptive delta management aimed to attain a long-term solution and adjust to future changes throughout the process. The capacity-building element involved working with all partners to develop the necessary technical expertise.

7. His own work as a special envoy, travelling the world to build coalitions for water resilience, underscored the importance of sharing the valuable knowledge and capacity acquired in local experiences. Water-related disasters were nowhere more widespread and costly in terms of human life and social wealth than in South and Southeast Asia. Indeed, 83 per cent of the population affected by rising sea levels lived in Asian cities. In response, the Water as Leverage for Resilient Cities initiative had brought together the local governments of Chennai in India, Khulna in Bangladesh and Semarang in Indonesia, and enjoyed the support of the Asian Infrastructure Investment Bank, the Global Centre of Excellence on Climate Adaptation and private partners. The pilot cities had made a commitment to make the Asian continent more resilient. Partners had vowed to collaborate with one another and with local communities and international organizations; the result was a cross-cutting approach to resilience that drew upon the technical, financial, social and cultural expertise of teams, organizations and networks. A consistent effort would be required to mitigate the impacts of rising sea levels, urbanization, land degradation and other phenomena. To that end, capacity-building must be undertaken to enable the participating cities to collaborate and help themselves. The Call for Action launched on Earth Day aimed to empower local companies, organizations and individuals to take the initiative to make their own cities resilient.

8. The time had come to seize the opportunities provided by the current crises, heed their urgency and take action. Governments and the United Nations system must endeavour to integrate those five elements into their approaches to building resilience, and collaborate to strengthen existing partnerships and invent new ones. The current approach lacked scale, impact and the necessary capacity to make progress. The Council's integration segment had a key role to play in linking and strengthening projects across the globe, in the service of future generations and a better planet.

9. **Mr. Ferreira** (Minister of the Environment and Housing of the Bahamas), panellist, said that although the Bahamas, as a country in the north Atlantic, was not typically associated with climate change, its topography and height above sea level left it vulnerable to devastating and increasingly common superstorms, as the world had witnessed the previous year. Despite the Caribbean's miniscule contribution to greenhouse gases, more intense and frequent hurricanes had become the region's new norm. As a result, the region's small economies were finding it difficult to sustain themselves while bearing the burden of high post-hurricane recovery and repair costs, a burden compounded by social ills that continued to hamper economic and social growth.

10. The Inter-American Development Bank had estimated that the tourism sector — his country's primary economic engine — had sustained $68 million in damage-related losses. Additional losses of $13 million in fisheries and $2.3 million in the social sector had contributed to a dramatic decline in economic growth, from 1.4 percent to 1 percent. Preparations under way for the 2018 Atlantic hurricane season were stark reminders of the devastation the two previous seasons had wrought. Amidst efforts to regain normalcy, the Bahamas continued to face challenges associated with such factors as attaining economic growth and modernization, reducing climate-related vulnerabilities and achieving the Sustainable Development Goals.

11. His country's strategies to mitigate vulnerabilities accounted for the often-neglected social impact of climate change, in addition to its economic and environmental impact. His Government relied heavily on the services of the National Emergency Management Agency to provide food, shelter and financial assistance to the most vulnerable. However, the 2017 hurricane season had revealed that national resources were insufficient to handle the level of devastation caused.

12. Exacerbated by climate change impacts, unequal access to education, health care, water and sanitation reduced a family's ability to recover from a disaster. National strategies must therefore include initiatives that improved community-specific resilience and increased access to critical resources and infrastructure in preparation for and response to natural disasters. Climate change also threatened food security in the Bahamas, which currently imported almost 90 per cent of its food supply. Moreover, unregulated food costs had led to unhealthy eating habits, which, in turn, had contributed to high rates of chronic non-communicable diseases and obesity.

13. In an effort to both address food security and improve dietary practices, his Government was providing tax-breaks on items featured on a newly approved list of healthy food items. It was also working to enhance local agricultural production, overhaul meteorological systems and provide more training opportunities in order to improve early warning systems. In addition, the Bahamas was taking steps to strengthen partnerships with communities and non-governmental organizations with a view to boosting climate resilience.

14. His country's major challenge in formulating strategies and policies to promote resilience was the lack of coordination and integration across government departments, which had resulted in the development of ineffective, redundant and disconnected strategies and policies. Government departments must communicate and identify shared synergies to strengthen cross-sectoral approaches to achieving the Sustainable Development Goals and improving the quality of life of all Bahamians. Owing to the country's archipelagic nature, strategies must be flexible and adaptable to the needs of smaller communities and islands. Ensuring that local governments had access to hurricane supplies and equipment was critical in reducing post-disaster response time and potentially mitigating the impact.

15. Another challenge was the reluctance of the disproportionately large ageing population to accept a technology-driven society; however, his Government was committed to leaving no one behind and making the transition a smooth one.

16. The country's elevated gross domestic product (GDP) and its classification as a rich country made it difficult to obtain funding for disaster relief and climate-centred strategies. The large percentage of persons with high net worth not residing in the Bahamas full-time factored into GDP calculations, driving up GDP and making access to funding that much more difficult. Making matters worse, the Bahamas was not scored on a vulnerability index. It would receive a high score, if that were the case.

17. Strategies would ultimately be fruitless without access to the necessary funding. In a country of some 400,000 people where most of the population resided in the capital city, but some islands had only 300 people, investment in large-scale renewable technologies and resilient infrastructure to protect vulnerable coastal communities came at a high cost. Nevertheless, his Government continued to revise existing strategies to meet the demands of a changing environment.

18. The Bahamas was open to the Council's policy recommendations and welcomed its assistance with integrating technologies, forming partnerships and financing sustainable development throughout the country. The Council's efforts to foster innovative approaches to sustainable development and integrate its three pillars into national resilience initiatives were imperative to the country's very survival.

19. His Government had committed to increasing the renewable energy share of the energy matrix to 30 per cent by 2020, and had revised its energy policies to adapt to a global shift towards renewables. A grant from the United Arab Emirates through the Caribbean Renewable Energy Fund would finance a solar application project at the national stadium that would offset 900 kilowatts of energy derived from traditional fossil fuels. Six electric vehicle charging stations would be provided to facilitate the national transition to a more sustainable transport sector. The Bahamas had also received funding from the Green Climate Fund of the United Nations Framework Convention on Climate Change to build capacity to address climate change.

20. In late 2017 the historically significant "Over the Hill" neighbourhood had been declared an economic empowerment zone, which meant that tax incentives and ownership opportunities were provided to the Bahamians living there as economic relief measures. Ragged Island, a small group of islands in the central Bahamas, had been devastated by Hurricane Irma, evacuated and declared uninhabitable. In response, his Government had pledged to make Ragged Island the first fully green island of the Bahamas: 95 per cent of the island's electrical needs would be met through solar energy and a battery storage system. The resulting savings would recover the $2 million cost of putting the system in place.

21. Diversifying the country's small economy was another crucial component of the effort to build climate resilience. To that end, his Government was working to make Grand Bahama, an island in the north, the technology hub of the Bahamas. Measures to increase employment and build capacity and embrace a new economic model aimed to reduce the high cost of green technologies. The annual Grand Bahama technology summit, a platform launched the previous year, was open to local and global technology companies that were interested in a presence in the Bahamas and in working with its Government to reform the country. Given that climate change and natural disasters knew no boundaries, there was a pressing need for the international community to come together to tackle those challenges.

22. **Mr. Chitradon** (Advisor at the Hydro and Agro Informatics Institute in the Ministry of Sciences and

Technology of Thailand), panellist, said that his Government's Hydro and Agro Informatics Institute had used science and technology effectively to develop disaster risk reduction at the community level. The Sustainable Development Goals could not be achieved without integrating disaster risk reduction efforts into the 2030 Agenda. His country's best practices had resulted from effectively combining innovations with indigenous knowledge.

23. The disaster risk reduction system in the central part of Thailand had been used to produce a flash flood potential index map. After the flood in Bang Saphan in 2017, the Informatics Institute had worked with the Ministry of the Interior to form a group and establish a command centre in southern Thailand. Divided into three main centres throughout the region, the group had developed a monitoring system and now worked together to produce reports twice a day and maintain contact with local communities, which provided updates and images of ongoing developments. Those updates were then marked on the flash flood potential index map. While the 2017 flood had been worse than the 2011 flood, the recovery period had lasted a mere two weeks, compared to two months for the previous flood, as a result of the improved disaster management made possible by hydroinformatics.

24. The floods had made it clear that efforts to mitigate and effectively manage the impact of disasters would require awareness and precise monitoring and early warning of disaster severity. Furthermore, science and technology could be used to improve post-disaster analysis and to rebuild with a view to preventing future risk, as building back better hinged on a thorough post-disaster analysis. A disaster risk reduction system based on hydroinformatics included a monitoring system with enhanced topography, a climate data system, use of that system to create a flood map index and a focus on improving normal, day-to-day operations, which was more cost-effective than focusing on post-disaster crisis management. Post-disaster analysis allowed for better adaptation and a better development plan.

25. Community water resource management at the local level improved the quality of disaster risk reduction efforts, which would be impoverished by a top-down approach. Facilitating community ownership ensured the sustainability of the overall system, integrating community innovation and making it possible to link the national level platform to the community level. The Informatics Institute made use of scientific and technological expertise and worked with communities by harnessing their valuable indigenous knowledge to address a wide range of issues in post-disaster management. Such issues as flood and drought, typically addressed separately, must be managed holistically, as floods could create drought if not managed properly. Such a bottom-up approach to sustainable development could yield tangible results in terms of food, water and energy security.

26. Integration would rely on continuous development of indigenous knowledge. The Khlong Yan community network in southern Thailand, for example, had made use of knowledge handed down from one generation to another regarding the different kinds of native trees and their impact on the ecosystem. Equipped with that information, community members had collaborated with the Informatics Institute to create water and land use maps. Based on the data supplied by those maps, the community had altered its agricultural and other practices and had succeeded in preventing post-flood droughts since launching the initiative. Using shortwave radio in the aftermath of a crisis had also enabled communities to maintain cost-efficient technology themselves.

27. The Phu Tum Phu Kratae community in northeastern Thailand, a community previously affected by drought, had developed a water use map and a water chart that had equipped the community to improve water management by using a canal to divert water through the village and reuse it, thereby increasing water supply. As a result, water supply during the dry season had increased dramatically.

28. In closing, he stressed the importance of acting to improve normal, day-to-day operation before disaster struck in order to build resilience by reducing disaster risk and thereby minimizing the cost of post-disaster recovery.

29. **Mr. Nour** (Director of the Regional Commissions New York Office), panellist, said that the timing of the Council's integration segment, on the heels of the 2018 Forum on Financing for Development Follow-up, helped highlight the cost of failing to act to mitigate the risks associated with natural disasters and the urgent need to mainstream resilience not only in national strategies, but also in the means of implementation of the 2030 Agenda for Sustainable Development. A recurring message from the forum and elsewhere was that the current pace and scale of investment were not sufficient to achieve the Sustainable Development Goals and that there must be a move from billions to trillions. Between 2018 and 2030, an estimated $415 billion a year — accounting for 7 per cent of investments in infrastructure — might be wiped out by disasters, in addition to the medium- and long-term social and economic impacts on increasingly interconnected economies and societies. The regional dimension must

also be taken into account, as the impact of climate change, natural disasters and other challenges varied from region to region, ranging from water shortages and conflict in the Arab region to extensive loss of life and material damage in the Asia-Pacific region.

30. For the first time, the financing for development framework had incorporated the disaster risk and resilience dimensions, recognizing that better ex-ante disaster risk reduction and resilience building mechanisms were needed to ensure sustained progress towards the implementation of the 2030 Agenda. Prevention and risk management, rather than disaster management, were also at the core of the Sendai Framework for Disaster Risk Reduction 2015–2030, which included a target aimed at increasing the number of States with a national risk management strategy in place. It was clear that risk and resilience must become part of relevant budgeting and financing processes in all countries. Significant steps had already been taken in many countries to establish a systemic approach to resilience and disaster risk reduction by incorporating risk assessments in their investment plans and social protection policies.

31. In support of national efforts in that regard, the Council and the United Nations system should leverage knowledge at the regional level, including the applied tools, methodologies and mechanisms developed by the regional economic commissions. For example, the Economic Commission for Latin America and the Caribbean (ECLAC) had developed and disseminated damage and loss assessment and post-disaster assessment methodologies. ECLAC provided strengthened leadership to the whole Caribbean region in the areas of disaster assessment and post-disaster needs analysis by providing technical expertise to disaster-affected and disaster-prone countries. In particular, ECLAC provided technical assistance to the Government of Cuba in terms of evaluating the impacts and vulnerability in its north western coastal area and generating databases, methodologies and tools with various applications for the country. Notable innovative financing solutions promoted by ECLAC included debt-for-climate adaptation swaps for the Caribbean, whose high-debt low growth conundrum was closely linked to climate-related natural disasters.

32. In Asia and the Pacific region, the Economic and Social Commission for Asia and the Pacific (ESCAP) had pioneered a regional drought mechanism that had been used to develop early warning forecasts for drought in Mongolia, in collaboration with national partners and relevant institutions. The ESCAP Regional Space Applications Programme for Sustainable Development had been used to bolster community resilience by providing information forecasting on water, land and crop management, thereby increasing the coping capacity of households. The ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness had also contributed to building resilience in communities through regional and national early warning systems for coastal hazards. The operationalization of the Indian Ocean Tsunami Warning and Mitigation System in 2011 had constituted a milestone.

33. In Africa, the African Climate Policy Centre of the Economic Commission for Africa was deploying a cloud-based high-resolution weather prediction and early warning system to enable African small island developing States to manage weather and climate-related risks. The Economic Commission for Africa and its partners had also established the Africa Climate Resilient Investment Facility, whose objective was to strengthen the capacity of African institutions to plan, design, and implement infrastructure investments resilient to climate variability and change.

34. In the Arab region, the Economic and Social Commission for Western Asia had developed a conceptual framework to address the water-energy-food security nexus in response to acute regional need. The practical applications of that approach included the Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region.

35. All stakeholders had an opportunity to support the design and implementation of policies, actions and tools for resilience. For the Council, doing so would entail incorporating resilience as a cross-cutting dimension in the 2030 Agenda and its means of implementation. States must include resilience and disaster preparedness components in national public investment systems, and develop capacities in disaster management and resilience efforts by means of stronger social policies. Meanwhile, regional action would include continued development and support of regional early warning and information systems, knowledge and data exchange, capacity-building and the use of existing regional platforms to test innovative solutions.

36. **Ms. Hamdouni** (Morocco), stressing the importance of regional cooperation in building resilience, said that her country's regional initiatives in that regard included the establishment in 2016 of the Blue Fund for the Congo Basin Commission. With an estimated capital of 3 billion euros, the Fund would be used to develop the economy of the Congo Basin by exploring alternatives to deforestation, improving the irrigation of farmland in the savannah and supporting eco-tourism.

37. **Ms. Amatya** (Observer for the Women Thrive Alliance) said that the Women Thrive Alliance brought together grass-roots women's rights organizations from over 50 countries, empowering them to influence gender justice and resilience agendas at all levels and to ensure that Governments, United Nations agencies and other stakeholders delivered on their promise of achieving gender equality by 2030 in a manner that prioritized grass-roots women's needs and solutions. The organization's 2017 National Sustainable Development Goals Scorecard had shown that grass-roots women's rights groups that included marginalized, vulnerable and indigenous communities were still being left behind, despite efforts by those groups to engage with Governments. She enquired how the Goals and gender equality could be achieved if those with the expertise and experience needed to create national policies and resilience-building programmes that left no one behind were themselves marginalized.

38. **Mr. O'Connor** (Observer for the International Union for the Conservation of Nature) said that he had been encouraged by the extent to which nature-based solutions were becoming part of the repertoire of government and community responses to climate change and strategies for resilience and disaster risk reduction. The International Union for the Conservation of Nature worked with local communities throughout the world to find hybrid solutions that combined nature with the best available modern technologies to address sea level erosion, storm surge and other threats related to climate change. He would welcome opportunities to explore ways for his organization to work with all stakeholders to introduce nature-based solutions to shared challenges. Much more research was needed to document the extent to which those solutions worked in practice and to demonstrate their cost-effectiveness compared to traditional solutions.

39. **Mr. Ovink** (Special Envoy for International Water Affairs of the Netherlands), welcoming the Blue Fund for the Congo Basin Commission, said that funding for sustainability and resilience was a complex issue that required patience and persistence. Building capacity regionally was one of the most complex issues when it came to water management, as water did not care about borders. Collaboration would help mitigate conflict and build peace, prosperity and sustainability. From a funding perspective, a focus should be placed on riverine systems.

40. Inclusive approaches were needed to connect grass-roots and non-governmental organizations with national Government initiatives. Radical inclusivity required participation from all stakeholders, at every stage of the process. That was the most difficult aspect of a resilient approach, because Governments, non-governmental organizations and other entities often followed other approaches that were not always flexible. An adaptive approach, however, was critical for implementing the 2030 Agenda.

41. A renewed focus on nature was conducive to inspiration and best practices as well as resilience in the world's natural systems. Although excellent examples of resilience and innovation could be found in all regions of the world, they, on their own, were not enough; everyone needed to leave their silos and make connections across all sectors.

42. **Mr. Ferreira** (Minister of Environment and Housing of the Bahamas) said that issues related to climate change and climate resilience challenged the way that nations related to one another. The metrics used for disbursing aid needed to be rethought, as aid should be distributed according to vulnerability and not according to GDP. The problem of climate change could not be tackled effectively unless all actors worked together to confront common threats. It was necessary to cooperate not only with allies but also with enemies, both real and imagined.

43. **Mr. Chitradon** (Advisor at the Hydro and Agro Informatics Institute in the Ministry of Science and Technology of Thailand) said that while technology was not a panacea, efforts should be made to ensure that policy decisions were based on appropriate science and technology. A science-based approach was essential for infrastructure development, amendments to standards and guidelines and the development of early-warning systems. Multi-stakeholder national platforms for disaster risk reduction could be an entry-point for better engagement on the part of science and technology stakeholders.

44. **Mr. Nour** (Director of the Regional Commissions New York Office) said that the transnational nature of the challenges of climate-related threats, the economic and social challenges of forced population displacement and the scarcity of natural resources made cooperation imperative. Morocco was to be congratulated on its forward-looking policies on renewable energy. In order to ensure the inclusion of the most vulnerable populations, risk and resilience should be incorporated not only in national strategies, but also in fiscal frameworks at the national level.

The meeting rose at 4.40 p.m.

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Integration segment

Summary record of the 24th meeting
Held at Headquarters, New York, on Thursday, 3 May 2018, at 10 a.m.

President: Mr. Matjila (Vice-President) ..... (South Africa)

Contents

Agenda item 8: Integration segment (*continued*)

Session 5: Panel discussion on "Leveraging technology and innovation to support resilience and inclusiveness in Africa in the context of the 2030 Agenda and Agenda 2063"

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In the absence of Ms. Chatardova (Czechia), President, Mr. Matjila (South Africa), Vice-President, took the Chair.

The meeting was called to order at 10.15 a.m.

Agenda item 8: Integration segment (*continued*)

Session 5: Panel discussion on "Leveraging technology and innovation to support resilience and inclusiveness in Africa in the context of the 2030 Agenda and Agenda 2063"

1. **The President** said that Session 5 would address the particular challenges of African countries. The discussion would explore how technological and innovative solutions applied to specific contexts had the potential to mitigate a significant number of the vulnerabilities of the continent, spurring progress towards the Sustainable Development Goals.

2. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project), moderator, said that Africa faced enormous development challenges in the economic, social and environmental pillars of sustainable development. The volatility of oil and other commodity prices further demonstrated the continent's vulnerability to global economic shocks due to reliance on a narrow base of raw-commodity exports. The Ebola virus crisis had illustrated the urgent need to build resilient health systems, including through promoting research and development for public health needs and using technologies for data collection and dissemination of information. Tackling the digital divide, building the capacity of data systems, boosting productive capacity and promoting innovation and entrepreneurship would be critical for maximizing the role of technology and innovation in boosting resilience and inclusive growth in Africa. Against that background the panellists would explore the synergies between the 2030 Agenda for Sustainable Development and the African Union Agenda 2063 to build sustainable and resilient societies.

3. The interactive discussions would be guided by the questions of how integrated public policy responses could support African countries in addressing vulnerabilities; what challenges African countries encountered in the formulation of integrated policies; what their experience had been in using technology and innovation to strengthen resilience and inclusion in an integrated manner; and how the United Nations development system and traditional, new and emerging development partners could support African countries in leveraging technology and innovation to support resilience and inclusiveness in the implementation of national, subregional and continental strategies.

4. She encouraged participants to be active on social media, using the hashtag #resilienceintegrated, during the interactive discussion, so that the discussion could extend beyond the confines of the conference room.

5. **Ms. Jallah** (Minister of Health and Social Welfare, Liberia), panellist, accompanying her remarks by a digital slide presentation, said that her country was not oblivious to the challenges it faced on all levels to ensure sustainability and resilience in the face of both internal and external shocks, which exposed its vulnerabilities in all the dimensions of sustainable development and its political and institutional structures as well. The key focus was finding solutions to strengthen resilience and preparedness to respond to specific threats and mitigate vulnerabilities. Gains in science and technology and innovation could be used as a tool to support gains in the daily life of its people.

6. The recent Ebola outbreak in Liberia illustrated those difficulties. Situated in West Africa with a population of over 4 million, the country faced a number of challenges in its health system, including high maternal and infant mortality rates. The first case of Ebola in West Africa had been reported in Guinea in December 2013; there had been over 28,000 cases and 11,000 deaths in the region. A state of emergency had been declared in Liberia in August 2014. One of the main factors contributing to the spread of the virus had been the weak public health surveillance system and its inability to detect the disease and respond to it in a timely manner. The panic over the virus had led to sensational newspaper headlines, even depicting the Government in a competition with the virus that the disease was winning.

7. One of the major game changers in fighting Ebola had been the deployment of technology that enabled heightened surveillance and contact tracing and improved laboratory technology that allowed for faster diagnosis and reduced turnaround time for lab results, as it was no longer necessary to send samples out of the country for testing. The health management information system that existed before the Ebola outbreak had been adequate for the country's ordinary needs but it had not stood up to the crisis. The post-Ebola surveillance strategy was aligned with the resilient health system plan and with the available technology. During the Ebola crisis from 2014 to 2016, Liberia had a weak health system, and it was working towards the goal of a resilient health system that could detect, prevent and mitigate disease outbreak.

8. In establishing the framework for the new Health Information System there had been much discussion over open source versus proprietary software. Regional coordination was also a priority, as Sierra Leone and Guinea had also been affected by the Ebola outbreak. National ownership and leadership of any new system was essential. Major challenges to the development of any new system were the sporadic electricity supply, poor road infrastructure, limited Internet connection and very little systems integration. Once those basic problems were addressed, Liberia would be in a better situation should another disease outbreak occur because it would be possible to monitor the situation much more easily.

9. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) asked about the role of civic engagement and public-private partnership in mitigating the challenges faced and enhancing the government's capacity to respond to future health crises.

10. **Ms. Jallah** (Minister of Health and Social Welfare, Liberia) said that inclusive engagement of the people and close cooperation with partners in other African countries toward common goals and sharing of best practices were of prime importance. Donor partners had also played a crucial role in raising capital for the technology which had allowed the health care system to gain control of the disease.

11. **Ms. Gawanas** (Special Adviser to the Secretary-General on Africa), panellist, said that the multi-dimensional development challenges faced in Africa required a comprehensive and multi-dimensional approach to its vulnerabilities, for example natural disasters, drought or health crises such as the Ebola virus. In the area of maternal mortality in particular, Africa was far behind the rest of the world. African economies were also vulnerable to external shocks owing to their over-reliance on natural resource exports, which had a negative impact on growth and sustainable development and affected the resilience and cohesion of societies. Comprehensive and integrated policy responses were needed that took into account such emerging threats as terrorism, forced migration and epidemics in order to increase preparedness and retain hard-won gains in Africa.

12. Pro-poor and gender sensitive policies would be critical for disaster risk reduction and the ability to respond to and recover from crises. Resilient and inclusive societies were deeply rooted in respect for human rights, reducing inequality and empowerment. The African Union Agenda 2063 had set a target of reducing 2030 levels of poverty by 30 per cent. Some 390 million Africans, representing half the world's poor, were still in poverty. Poverty eradication must be mainstreamed in order to achieve the goal of leaving no one behind. The national coordination mechanisms for the 2030 Agenda must harness the linkages between the Goals and targets. Poverty eradication could not be achieved in isolation from the provision of basic services — clean water, sanitation, electricity, health care and education. Empowerment of women and youth entailed action across the entire 2030 Agenda, and advancing regional integration would boost productivity and access to jobs. The power of market women and those who worked the soil should not be underestimated; the informal economy, where most women were employed, should receive greater attention.

13. International development cooperation played a crucial role in closing the financing gap and complementing domestic resources. Governments must prioritize investment in education, training, skills development, social protection and infrastructure. Official development assistance (ODA) was still important to the least developed countries, and partners must deliver on their commitments in that area. Another area of concern was curbing some $60 billion in illicit financial flows from Africa, which surpassed the annual aid volume. Such action would unlock significant resources for development.

14. Leveraging technology and innovation required targeted investment in infrastructure such as broadband connectivity in order to reach the poorest. Technological applications could be useful in such areas as financial inclusion, environmental monitoring and providing meteorological data to small farmers. However, Africa still lagged in access to information and communications technology (ICT); only 18 per cent of households had Web access and the digital gender gap, which was shrinking in most of the world, had actually widened in Africa.

15. Harnessing technology at the local level required an enormous investment in infrastructure development as a key driver for progress. It was shameful that millions of rural Africans still lacked electricity, sanitation and clean drinking water in the age of the fourth industrial revolution. African women should not have to spend hours every day carrying water for drinking and cooking.

16. Conflict prevention and tackling emerging threats to peace and security were indispensable to building resilience. Understanding the interaction between natural disasters, environmental hazards and other triggers of conflict would be crucial for tackling it root

causes. Support for African initiatives was needed in order to create the Africa that the Africans wanted.

17. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) asked whether there was strong political will to engage women and youth as development actors and not just beneficiaries, and if so, whether the right policies were in place to support them.

18. **Ms. Gavanas** (Special Adviser to the Secretary-General on Africa) said that there had been significant progress in women's participation but more must be done. Women for the most part provided the resilience of their communities during difficult times, yet they still lacked decision-making power. The women who operated market stalls might not have educational credentials or degrees, yet they were important participants in economic activity that built their communities. Youth presented a challenge because there was little economic opportunity for them and the current move to downsize the public sector meant that Governments should not be counted on to provide employment. Partnership with the private sector seemed to be the best way forward in that case.

19. **Ms. Ibrahim** (Senior Vice-President and Head of Market Area, Middle East and Africa, Ericsson), panellist, accompanying her statement with a digital slide presentation, said that technology had enabled various forms of innovation and had helped to build inclusion and resilience in Africa. Integrated public policy was critical to address the challenges and to enable inclusion.

20. More than half the population of the African continent had access to services to meet their basic needs, and mobile technology could drive social and economic growth. A study that Ericsson had conducted with the Imperial College, London, in 2017 had revealed that every 10 per cent increase in mobile broadband penetration resulted in up to 2.8 per cent in economic growth. It was clear, therefore, that increased access to mobile technology was a positive factor in macroeconomic development. Technology also supported the Sustainable Development Goals, in particular Goal 1 on ending poverty, Goal 3 on health, Goal 4 on education and Goal 5 on gender equality.

21. Africa remained the fastest growing mobile market, with 800 million subscribers, or 65 per cent of the population, in 2017. With an anticipated annual growth rate of 6 per cent over the coming five years, there would be 1 billion subscribers by 2023. The infrastructure necessary to support those new subscribers must be cost-efficient and robust. The increased use of virtual reality and streaming services would require higher speeds and greater bandwidth with lower latency. In attempting to ensure broad access, Governments should look at spectrum allocations, as the lower end of the spectrum, from 700 to 800 mhz, could be useful to provide coverage for rural areas and villages, as long as they were complemented by appropriate access to higher bands. Her company had collaborated with the Columbia University Earth Institute, Millennium Hope and other telecom companies to provide access to villages, but more private companies must become involved.

22. Mobile money solutions such as the mobile wallet had led to greater financial inclusion. Smartphones had put financial services within reach of farmers, women and entrepreneurs with home-based businesses, for example. Even governments were using mobile and online solutions for health insurance payments and many other types of services and had found that they increased revenues. Some thought was needed on how to use that toolkit in a better way and to make it fast and secure so that financial institutions would also be interested.

23. People were Africa's greatest asset, and they should be equipped with the needed skills in such areas as data science and mobile commerce. Her company had thus begun a training programme in ICT for primary school girls in Cameroon and South Africa which they hoped to expand. In order to build resilience and accelerate inclusion through mobile connectivity, infrastructure must be in place, phones must be affordable and consumers educated on their use. It was also important to harmonize public policy across countries and increase collaboration between the private and public sectors through incentives for innovation.

24. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project), raising the matter of corporate social responsibility, asked what advice she would give Member States and civil society in designing a value proposition to motivate private sector investment in development.

25. **Ms. Ibrahim** (Senior Vice-President and Head of Market Area, Middle East and Africa, Ericsson) said that the essence of her company's involvement in development projects was the desire to do something good for the people. Actions toward achieving the goal of a sustainable future for Africa would build the company's future also. Incentives were also needed, however. Government sectors could support start-ups and universities in collaborations or invite them to set up development hubs. Those joint efforts must find the right balance between corporate and government involvement.

26. **Mr. Selker** (Director of International Sales, Trans-African Hydro-Meteorological Observatory (TAHMO)), panellist, accompanying his remarks with a digital slide presentation, said that the Observatory was a specific example of technology addressing some of the issues raised in the discussion on resilience and innovation. The story of the Observatory had begun in 2010 when two scientists conducting a hydrology experiment in West Africa had looked for precipitation data for earlier years and had found no record of such fundamental data. They had then set about the ambitious task of providing weather monitoring across the whole continent. Forty years earlier there had been good weather data for Africa, but over the years weather stations had slowly gone silent.

27. Weather information was foundational to resilience as it affected such important areas as agriculture, infrastructure and natural disaster preparedness. Among challenges to the climate observation system was the legitimate competition for limited public funds and a lack of sustainability in the network of weather stations, which had generally been set up from a short-term, project-based approach but not maintained. Economies of scale were also important, as data was needed on a continental scale rather than country by country. Unfortunately, satellites had not been able to fill that need — they were able to show cloud cover, for instance, but could not measure how much rain had actually reached the ground.

28. Weather data was part of critical infrastructure with a known value to agriculture, infrastructure, the economy and health, and the data and its collection infrastructure also had a future scientific and economic value that was as yet unknown. Africa held 60 per cent of the world's arable land and excellent water resources, and was poised to play an important role in the coming century. The technology revolution provided opportunity through improved ability to collect, store and process data and to share it by bringing it directly to users like farmers through the expanded availability and use of smartphones. The weather station itself had been designed through a public-private partnership. It had no moving parts and was powered by a solar panel the size of a business card. It could detect rain, wind, humidity and even lightning up to 40 km. away.

29. Of course, technology alone would not fix the problem or guarantee sustainability. A concerted effort had been made to partner fully with Governments by providing the data from the weather stations to their weather services and any scientific endeavours free of charge, selling the data to private organizations like IBM, which owned The Weather Channel, in order to fund the system. There were currently some 500 stations installed, with a goal of 20,000. As an example of the benefits of reaching that goal, there would then be enough local data available to support crop insurance claims for African farmers, which was currently not possible. Those weather stations could be set up for one-tenth the cost of a traditional station. The ultimate source of resilience was human education, and thus most of the weather stations had been placed at schools. The stations were used in science, geography, mathematics, engineering and statistics education, and monthly research challenges were set for the students. A school-to-school programme paired those schools with schools in the United States to connect across cultures.

30. To summarize, he listed the keys to success as reliable and inexpensive technology, full partnership with Governments, a sustained enterprise approach rather than a short-term project approach, and the production of data on a continent-wide scale that was attractive to private enterprise.

31. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) asked whether the greatest challenge was capacity or political will.

32. **Mr. Selker** (Director of International Sales, Trans-African Hydro-Meteorological Observatory (TAHMO)) said that the considerable success achieved demonstrated that both the capacity and the political will existed; the greatest challenge had been moving from a project-based to an enterprise mindset, especially given the low cost of the technology. Government meteorology departments had also been somewhat isolated, and some effort was needed to instil a mindset of data sharing.

33. **The President** asked about the plan for maintenance of the weather stations in order to ensure their sustainability.

34. **Mr. Selker** (Director of International Sales, Trans-African Hydro-Meteorological Observatory (TAHMO)) said that a network of company staff travelled throughout Africa to check on the stations and maintain them. Students at the schools where they were placed also were involved in their cleaning and maintenance. With no moving parts, the stations were designed to last, and because of their low cost, their replacement was not a great burden.

35. **Mr. Ogure** (Coordinator, Map Kibera Trust, Kenya), panellist, said that he made his home in Kibera, an informal settlement and slum of Nairobi, Kenya, which was actually the largest slum in Africa. In 2009, Kibera was simply a blank spot on Government maps. Its residents felt marginalized, ignored and neglected by

that omission, and they decided that they wanted to show the world their home. Thus, thirteen youths from each of the thirteen villages making up Kibera walked around their neighbourhoods equipped with GPS devices on their mobile phones mapping all the points of interest and what was important to them. With the help of OpenStreetMap, they produced the first digital map of Kibera. That map was congested with information, and thus, through a community forum, ten categories of information were broken down to four main areas — health, security, water and sanitation and education — and a map on each topic was produced.

36. One of the mandates of the Map Kibera project was to increase influence and representation of the marginalized communities through creative use of digital technology for action. After the mapping was completed, the group decided to introduce citizen journalism to give people a platform to speak about the issues highlighted by the map. The Voice of Kibera website (voiceofkibera.org) was formed to allow people both to send and receive reports and information by SMS. That was followed by a video platform created by youths walking around the neighbourhood with video cameras interviewing residents, which gave them a platform to tell stories from their perspective. The videos were posted on a YouTube channel and shared with the relevant authorities, responders and policy-makers for action.

37. In an effort to go deeper into the use of the mapped data, the Open Schools Kenya project produced a profile page for each school in the neighbourhood, with the aim of making the information accessible to parents and students so that they could make an informed choice about schooling for their children. Groups often came to Kibera to conduct research projects, yet the results were never shared with the residents, and thus, in an effort to be transparent, each school was given a printed copy of the education map and shown how to use its profile page from the website. Many of the schools in Kibera were informal, and the Member of Parliament for Kibera had made use of the data to upgrade them and secure government help, arguing that the schools might be informal but the students were not — they were citizens who also deserved services from the Government. Going offline to ensure that no one was left behind, the subject maps had been painted on walls throughout the neighbourhood as well. The aim of all the projects was to fight the mentality that Kibera was a bad place by showing that there were good things in the community as well as good people.

38. The project had moved into other informal settlements to train people in the technology, ideas and skills needed to map their own areas. The World Bank was partnering in mapping of projects within the counties so that, under the participatory budgeting model, they could decide what the greatest investment needs were — for example schools, hospitals, markets — and where they should be placed. In those ways and many others, the Map Kibera project had tried to leverage technology to support innovation and inclusiveness.

39. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) asked about the cost implications for users of the digital platforms mentioned and whether that had an impact on the number of people making use of them. In her view, Africa lacked a culture of accountability, and she wondered whether the increased citizen engagement described had led to more accountability by the Government in meeting its commitments.

40. **Mr. Ogure** (Coordinator, Map Kibera Trust, Kenya) said that the cost to users of sending a message by SMS was very low. Experience had shown that the minimal cost had cut down on the amount of junk messages received; a cost to the user, even a small cost, meant that only serious messages would be sent.

41. Kibera News Network had earned the trust of the community because it was run by residents and depicted the real situation. There was little trust in mainstream media, which only came to the area when there was a crisis which they could show in a negative light. Tagging the relevant authorities and others with video reports had been very effective in getting swift action. A recent example was the video of schools being demolished in Kibera to make way for the expansion of the Kenya-Uganda railway, which had been tagged to the World Bank, Amnesty International and the Government and had received a powerful response.

42. **Ms. Hamdouni** (Morocco) said that the power of cooperation was crucial to resilience. Morocco was making South-South cooperation with African countries a priority and had entered into a number of projects and partnerships with its African neighbours, most recently possible agricultural cooperation with Liberia and economic cooperation with Nigeria.

43. Regarding the use of technology and innovation, it would not be possible to make the most effective use of technology without capacity-building, especially in the most fragile countries. She would like to hear more about concrete solutions for capacity-building, especially in areas where there was a lack of infrastructure.

44. **Ms. Triyanti** (United Nations Major Group for Children and Youth) said that the idea of a sustainable

network approach would not work without leadership. She would be interested to know if there were best practices regarding the type of leadership needed, what worked in Africa for sustainability, and whether there were any multi-stakeholder partnerships where science and research institutions had been included in the process of evidence-based policy making. Regarding education, it was her view that in the context of disaster reduction and conflict, investment in capacity-building and education for young people and girls was just as important as investment in relief and rehabilitation, as it would define resilience for the future.

45. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project), posing questions received on Instagram and Twitter, asked how it was possible to speak of resilience for innovation in a context where the vast majority of new intellectual property filings had come from Asia, the United States of America and Europe, but none from Africa, according to the World Intellectual Property Organization (WIPO). A participant from social media would also like to know what policy environment was needed to achieve inclusion.

46. **Ms. Jallah** (Minister of Health and Social Welfare, Liberia) said that to expand public-private partnerships, it was important to train youth to take over the new systems to ensure their long-term sustainability and national ownership. Collaborative leadership was needed so that countries could come together around common goals and achieve buy-in to the new situation.

47. As for policy, it was important to answer basic questions, first by setting targets — what was the problem to be solved? Next, a strategy was needed — what action should be taken? Lastly, the question must be asked: who would pay?

48. **Ms. Gawanas** (Special Adviser to the Secretary-General on Africa) said that the causes of conflict had to do with exclusion and a sense that people were not part of decisions affecting their lives. With regard to leadership, the people knew best and must participate in solutions for sustainable impact. A policy environment that promoted inclusion was needed.

49. With regard to intellectual property, innovation did not happen in isolation, and ideas must be backed up by resources and protected. More thought was needed on how to accomplish that. In order to increase policy coherence and integration, the various ministries within governments must speak to each other and harmonize approaches.

50. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project), said that a participant had asked on Twitter where the funding was for the innovations being discussed; there were many solutions but no capacity to implement them.

51. **Mr. Muhammad Bande** (Nigeria) said that the fact that the African continent had overcome slavery and apartheid demonstrated the existence of political will. Youth was a main theme of activities within the African Union, and the youth had overcome many challenges. There were significant efforts in the area of capacity-building; in fact the African Union had established its first development administration institute in 1967, over 50 years earlier. Innovative projects such as Map Kibera were very exciting; it was important to push as hard as possible for funding for such activities.

52. **Ms. Ibrahim** (Senior Vice-President and Head of Market Area, Middle East and Africa, Ericsson) suggested that in terms of capacity-building, Internet access was still not broad, and the little-used analogue television spectrum would be more cost-effective in expanding coverage.

53. The private sector was already well-represented in Africa, and Government policies could be drafted requiring them to give back to the community in terms of innovation and infrastructure in order to support innovation hubs, for instance. With regard to intellectual property, mobile money was a good example. If such a product was locally created, it belonged to its creators and could be resold to produce funds for investment in innovation.

54. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) said that governance at its best enabled, and at its worst impeded, development. She asked the panellists to comment on what could be done about factors that undermined transformation in Africa.

55. **The President** said that he would like to hear more about how technology could be used to assist the disabled in Africa. He was also interested to know if weather data could be used by urban planners to improve conditions in slums and other informal settlements by guiding decisions on whether informal settlements should be made permanent or moved to safer and more hospitable locations. The cities of Africa were growing and expanding at a rapid pace and some rational planning was needed.

56. **Mr. Selker** (Director of International Sales, Trans-African Hydro-Meteorological Observatory (TAHMO)) said that his organization was founded by scientists and the data it produced was intended to be free for use by other scientists, in support of intellectual property rights. In terms of future planning, the climate

was changing, and although there was currently no record of past changes for Africa, it would be important to have a long data set in the future to guide the response to changing conditions. Although most existing weather stations were in rural areas because of the focus on providing data for agriculture, it would certainly be possible to place stations at schools in unofficial settlements in the care of motivated students. The existence of a settlement became more legitimate when data about it had been collected.

57. **Mr. Ogure** (Coordinator, Map Kibera Trust, Kenya) said that Kibera had a population of 400,000 people living on 2.5 square km.; the population was highly diverse. Capacity-building had been key to the project. Board members had encountered a group of enthusiastic youth, who themselves had come up with the idea of using OpenStreetMap, although most had never touched a computer before the project; they had started from scratch. It was illegal for people to live on the land on which Kibera lay, but people with no alternatives had encroached on the space anyway, and the systems to support it were not working. The issue of permanence had been raised; it had been argued that the Government had to give notice of eviction and also provide somewhere else for the residents to go. UN-Habitat was coming in to help, and the company building the railway expansion was also building permanent housing for residents. The expectation was that through such efforts, the slum would eventually disappear.

58. **Ms. Phaladi** (Founder and Executive Director, Gogontlejang Phaladi Pillar of Hope Project) invited the panellists to share the commitments to action by their respective countries and organizations.

59. **Mr. Ogure** (Coordinator, Map Kibera Trust, Kenya) said that knowledge was power, and his organization would endeavour to make the invisible visible using data and citizen journalism. Its commitment was to spread those methods across Africa with help from all development partners.

60. **Mr. Selker** (Director of International Sales, Trans-African Hydro-Meteorological Observatory (TAHMO)) said that his organization had a commitment to pay attention to the quality of data it produced. The efficiency and sustainability of the effort to acquire data and the buy-in and collective interest it had attracted would carry the project into the future.

61. **Ms. Ibrahim** (Senior Vice-President and Head of Market Area, Africa and Middle East, Ericsson) said that policy formulation was of critical importance, and that the United Nations could play a role in that dialogue. Her company had a strong commitment to the expansion of broadband access in Africa, to be demonstrated by her attendance at the forthcoming Broadband Commission meeting in Rwanda.

62. **Ms. Gawanas** (Special Adviser to the Secretary-General on Africa) said that the world as a whole had set the Agenda 2030, and Africa had set its own agenda through 2063. The international community must now find coherence and support Africa accordingly. South-South cooperation was critical in allowing countries to learn from each other and to take advantage of economies of scale.

63. **Ms. Jallah** (Minister of Health and Social Welfare, Liberia) said that she was committed to taking the best practices gained through dialogue back home to her country. She would look to the United Nations for help in acquiring technology tailored to the regional context and in enhancing cross-border detection of infectious diseases.

64. **The President**, concluding the discussion, said that the members of the panel had given him great hope for the future of Africa.

The meeting rose at 12.40 p.m.

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The meeting was called to order at 3.15 p.m.

Agenda item 8: Integration segment (*continued*)

Panel discussion: "Designing a resilient and sustainable future — a toolkit to better prepare for tomorrow"

1. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York), moderator, said that, three years after the adoption of the 2030 Agenda for Sustainable Development, more effort was needed to achieve the Sustainable Development Goals. The present discussion would address frontier technologies for building resilience and the impact of technology on policy planning.

2. Since the industrial revolution, science had been the engine of prosperity. However, that prosperity was now imperilled by threats both natural and self-inflicted. Global warming, modern warfare and epidemics limited the capacity of the Earth to sustain its expanding human population. The 2030 Agenda was humanity's effort to create cycles of virtue at critical nexus points in response to those challenges.

3. He suggested framing the discussion on the basis of various questions: What policy planning instruments were available to help countries prepare for hazards? Had technology and innovation helped countries use those instruments more effectively? What regional and global tools were available to support countries' efforts to improve resilience? And how could the Council leverage such tools to assist countries?

4. **Mr. Valdés González** (Director-General of Civil Protection, National Centre for Disaster Prevention, Mexico), panellist, accompanying his statement with a digital slide presentation, said that his Government had adopted a Civil Protection Act that was being approved by the 32 states of Mexico. In the space of one month in 2017, his country had been severely tested by two earthquakes, several tropical storms and several hurricanes. The costs had been over 10 times the available disaster funds, although the larger of the two earthquakes, of magnitude 8.2, had exceeded the threshold for activation of the Government's $150 million catastrophe bond. The best results were achieved when rebuilding funds were distributed to the women of the families in need.

5. Mexico conducted earthquake drills every year on 19 September, the anniversary of the 1985 Mexico City earthquake. Ironically, one of the 2017 earthquakes had occurred two hours after such a drill. The other earthquake had occurred at 10 minutes to midnight, and residents of Mexico City had received prior warning of 85 seconds, an amount of time that would be useful only to a person who had participated in frequent drills and knew exactly what to do.

6. His Government was required by law to provide preparedness information in the 68 native languages of Mexico. The National Centre for Disaster Prevention had found that disaster awareness advertisements that featured children were particularly successful. Technology had great potential to assist in disaster preparations. Generators were helpful, provided they could produce electricity for a long time. Satellite technology had vastly improved access to weather information. His Government was expanding public access to information previously made available only to the authorities. However, the poorest and most vulnerable municipalities in Mexico often lacked technological infrastructure. In addition, culture often hindered preparedness; many events were attended only by women and children, while the men stayed away. Demographic data could show what approaches were best for particular areas.

7. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) wondered, in the light of the call in the 2030 Agenda for Governments to work together to created integrated solutions, how the Government of Mexico had been encouraging the National Centre for Disaster Prevention to reach out to other similar agencies, and also how it interacted with civil society.

8. **Mr. Valdés González** (Director-General of Civil Protection, National Centre for Disaster Prevention, Mexico) said that although the Federal Government had adopted the Civil Protection Act, the states still needed to be convinced to adopt it. The Centre had shared its preparedness atlas with other Central American countries. No one Government by itself could address all disaster risks.

9. **Ms. Sindi** (Founder and President of the Institute for Imagination and Ingenuity and member of the 10-Member Group to Support the Technology Facilitation Mechanism (2016–2017)), panellist, said that, as senior science, technology and innovation adviser at the Islamic Development Bank, she focused on supporting frontier technologies that could help improve resilience and save lives. In response to human, natural and climate disasters, the Bank had established a resilience and climate change unit to support low-carbon development, the green economy and sustainable systems that adapted to changing climatic conditions. To address disasters resulting from human activity, the Bank provided support for relief assistance, education

and health services, and offered financing for development projects, emergency response, disaster recovery and capacity-building. It also aimed to strengthen regional and international cooperation for the implementation of the 2030 Agenda.

10. More accurate predictions could help find the most economical path to lower risk. To that end, the Islamic Development Bank was making use of the Global Observatory of Science, Technology and Innovation Policy Instruments, developed by the United Nations Educational, Scientific and Cultural Organization (UNESCO), to enhance its own use of science, technology and innovation and to help its member countries predict disasters and take preventive action. Among the frontier technologies used to manage risks were satellite geodesy, through which micro-movements on the surface of the Earth could be observed; community artificial intelligence, which allowed the tracking of changes in rainforests and crime hotspots through the collection of mobile camera data; and biotechnology, which was changing approaches to disease and the use of antibiotics. All those technologies could help prepare for disasters.

11. The Bank had set up a science, technology and innovation department to encourage high-impact investment in frontier technologies. Its initiatives included Engage, a digital platform designed to connect investors and inventors in developing communities with market opportunities and funding, and the $500 million Transform fund to finance innovation. A nurturing environment for global partnerships, which were the key to promoting resilience and frontier technologies, must be established.

12. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) wondered what policy frameworks and economic incentives should be established by Governments to encourage the private sector to involve more young people, particularly women, in innovation, science and partnership.

13. **Ms. Sindi** (Founder and President of the Institute for Imagination and Ingenuity and member of the 10-Member Group to Support the Technology Facilitation Mechanism (2016–2017)) said that the Islamic Development Bank involved all stakeholders in its science, technology and innovation investments. One of its projects involved training women to install solar panels. All the Bank's projects took into account a climate perspective. Good policies needed to be accompanied by the right incentives and instruments, and must be sensitive to tradition and culture.

14. **Mr. Ahmad** (Director a.i. of the United Nations Environment Programme (UNEP) New York Office) said that climate change was a natural disaster multiplier. Climate risk insurance, which was becoming increasingly prominent in discussions on managing such risk in developing countries, could be implemented at the micro level, where individual policyholders paid premiums and received payouts directly; the meso level, where risk aggregators such as associations, cooperatives, credit unions or non-governmental organizations received payouts and then provided services to individuals; and the macro level, where policies were held by Governments or national agencies, and payouts were used to finance post-disaster programmes and relief efforts for predefined groups.

15. The two main types of climate risk insurance were based either on indemnities, in which case claims were calculated by assessing damage that had already occurred, or on indexes, in which case payouts were triggered when a defined threshold, such as a certain amount of rainfall within a given period, was exceeded. Risk pools had been established for a number of major regions. In Africa, the risk pool was the African Risk Capacity, an African Union agency that was developing the Extreme Climate Facility, a mechanism to help States access private capital should the number of extreme weather events increase.

16. Climate risk insurance products were transitioning from traditional indemnity-based products to index-based and hybrid products. Picture-based crop insurance, whereby crop farmers' own smartphone pictures were used to verify losses, was being piloted. Many agriculture-related programmes linked insurance to credit, access to modern inputs, better technologies or better market outlets for farmers. Technology played a crucial role in building accurate and cost-efficient climate risk solutions. Remote sensing and satellite data had become essential in expanding index-based insurance in developing countries, expediting payouts and enabling risk-reduction activities based on potential drought or flood damage. Blockchain technology could be used to automate insurance processing and enable payouts without a claim being filed. Insurers were also taking advantage of mobile banking technologies to collect premiums and make payments. Crowdsourcing and social networking had made possible peer-to-peer insurance, yet another way in which innovative technology was helping mitigate disaster risk.

17. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) requested further information regarding the ways in which such technologies as satellite imagery,

blockchain and weather data were applied at the grass-roots level.

18. **Mr. Ahmad** (Director a.i. of the United Nations Environment Programme (UNEP) New York Office) said that the data regarding the application of such technologies were difficult to obtain, but would be crucial in achieving the Sustainable Development Goals.

19. **Mr. Moutenot** (Co-founder of Upstream), panellist, accompanying his statement with a digital slide presentation, said that Upstream automated the processing of satellite data to support decision-making in conservation and development. For example, to help monitor the extent to which farmers involved in conservation projects had complied with water use requirements, the company had automated the analysis of timestamped geospatial observations related to those farmers' fields, thereby obviating the need for conservation groups to inspect individual farms and reducing the cost of monitoring. Upstream had also used timestamped location outlines to produce a large dataset of dams, including those that did not appear on conventional maps, and to automate the detection of locations appropriate for the establishment of low-head-distribution hydropower facilities. That technique could be applied in many other areas, including the delineation of fields and the detection of crop types and irrigation technologies. In partnership with the Nature Conservancy, a United States non-governmental organization, the company had used satellite data to produce a map that showed the depth of water at project locations. That technology could be adapted to show flooding in coastal or urban areas, calculate insurance benefits and model future flood resilience and construction following a disaster. Automated satellite detection could be used to plan project locations, monitor implementation, and optimize results by simulating outcomes. Upstream had recently entered into a partnership with the International Space Station and a private corporation to monitor water management in cotton production in the world's largest river basins. The company's work enabled large-scale monitoring based on field-level data. To make satellite data accessible to the people who implemented projects on the ground, Upstream had developed interfaces for conservation groups, clean energy implementers and others.

20. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) requested further information regarding the ways in which Upstream worked with national Governments; regional, state and local governments; and non-governmental organizations.

21. **Mr. Moutenot** (Co-founder of Upstream) said that collaboration with governments was most effective at the regional, state and local levels, where knowledge of the situation on the ground was greatest. For example, Upstream was working with the state of California to improve watershed management through a United States Government conservation innovation grant. Relationships with people on the ground were also essential in working with non-governmental organizations and corporations; Upstream was currently working with the Environmental Defense Fund, a United States non-governmental organization, to measure whether coastal resilience projects in the state of Louisiana had performed well enough to qualify for financing through an environmental impact bond.

22. **Mr. Zimmerman** (Co-founder of Coolar), panellist, accompanying his statement with a digital slide presentation, said that 1 billion people in the developing world had no access to electricity and many more lived in energy poverty. As a result, refrigeration was scarce in developing countries and 75 per cent of vaccines were damaged by being stored at the wrong temperature, including by being frozen. Coolar had invented a solar-powered refrigeration system with no battery, running costs or rotating parts. The refrigerant was water, which did not emit carbon dioxide if it leaked, and the system was guaranteed not to freeze vaccines. The company had produced a refrigerator for rural health centres, with a solar panel on the roof. Following field studies among nurses in Kenya and India, it was developing smaller refrigerators, including portable prototypes.

23. The Coolar business model was based on the sale of products to development organizations, health institutions, Governments and private organizations. The company worked with partners in industry and in the field, and the Governments of India and Kenya. Its technology could also be applied in agriculture and transport. Investors in the cold chain market, whose value was estimated at $170 billion, would be willing to finance the Coolar system to reduce the financial losses resulting from the improper storage of vaccines and food.

24. Programmes should be established to enable small companies to interact seamlessly with large organizations such as the United Nations. Long-term innovation and research programmes should be established to match the slow evolution of enterprise incubation and acceleration networks. To facilitate technology transfer in education, experts should be brought together online or in person to exchange ideas and work together on projects. Researchers from developed countries should travel to developing

countries to understand problems on the ground and incubate academic knowledge locally through start-up companies that would, if successful, also benefit people in developed countries.

25. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) requested further information regarding which types of hybrid organization, combining elements of entrepreneurship, civic activism and philanthropy, were most suitable to the establishment of multi-stakeholder partnerships and the achievement of the Sustainable Development Goals.

26. **Mr. Zimmerman** (Co-founder of Coolar) said that the challenge of sustainable entrepreneurship was to make profit while doing good. Sustainable companies sometimes made less profit than traditional businesses, but they gained more media attention, which was attractive to investors, and did not face the problems encountered by public-private partnerships and joint ventures in balancing different interests. Sustainable companies and grass-roots movements were able to address issues that could not be resolved by companies driven solely by profit. In establishing a sustainable company, the best approach was to begin by taking action to promote sustainable development and, subsequently, to build the business.

27. **Mr. Moutenot** (Co-founder of Upstream) said that he had raised funds from venture capitalists for previous enterprises, but had not done so for Upstream to avoid conflicts with the company's mission of encouraging environmental conservation. The greatest challenge facing sustainable companies was to find funding from sources whose aims did not conflict with sustainable development.

28. **Ms. Sindi** (Founder and President of the Institute for Imagination and Ingenuity and member of the 10-Member Group to Support the Technology Facilitation Mechanism (2016–2017)) said that no framework to support social entrepreneurship existed in the Middle East, where the situation of entrepreneurs was organic and evolving. An environment in which sustainable innovation could thrive must be established to engage creative minds and ensure that no one was left behind. The Transform fund of the Islamic Development Bank had been established to support entrepreneurs in proving concepts, attracting investors to expand companies, commercializing innovation and building capacity. The Fund was intended to engage all stakeholders to establish a culture of creativity.

29. **Mr. Gómez** (Vice-Minister for Science and Technology of the Dominican Republic and Chair of the Commission on Science and Technology for Development at its twenty-first session), discussant, said that the Commission on Science and Technology for Development was the forum for discussion of the ways in which science, technology and innovation could support sustainable development and the implementation of the 2030 Agenda. Its mandate was to improve understanding of science, technology and innovation policies, particularly in developing countries, and to formulate recommendations and guidelines on science and technology in the United Nations system. At its previous sessions, the Commission had discussed the opportunities and challenges presented by information and communications technology, and the implications of massive online courses, three-dimensional printing and digital automation, inclusive digital society, and strategic foresight. At its twenty-first session, to be held in May 2018 in Geneva, the Commission would address the role of science, technology and innovation in increasing substantially the share of renewable energy by 2030 and building digital competencies to benefit from existing and emerging technologies.

30. The Commission had recently addressed the opportunities and challenges in sustainable development related to renewable energy, smart cities, urban planning and geospatial technologies. Progress in such geospatial technologies as the Global Positioning System, data crowdsourcing, web mapping and geospatial information systems could increase the resilience of cities in line with Sustainable Development Goal 11 by improving aid delivery and disaster recovery, prevention and preparedness. Geospatial technologies could also help policy planning and show the effects of disasters on societies; during the 2010 Haiti earthquake, the United Nations and other organizations had coordinated aid delivery using maps based on satellite and crowdsourced data. The Central America Probabilistic Risk Assessment initiative, supported by the World Bank, modelled disasters and had established an open disaster-risk-assessment platform.

31. Through innovation, States had improved their disaster planning and policies and developed new technologies. Big data and computer simulations had improved foresight in sustainable development and maximized the benefits of technology in risk mitigation. Governments had used science, technology and innovation, together with information and communications technology, to meet the challenges of sustainability and inclusion in urban planning. For example, in the Netherlands, data generated by a smart traffic management system was used to predict and monitor traffic density, while, in Brazil, crowdsourcing

data and algorithms were used to predict natural disasters and crimes.

32. The Council's substantive commissions helped Member States build resilience. The Commission on Science and Technology had analysed the use of nanotechnology to purify water and produce energy; the use of drones to deliver supplies, enable precision agriculture and replace humans in dangerous tasks; and the use of satellites to monitor environmental and crop damage. With regard to the establishment of resilient societies, the Commission had analysed the possible impact of new technologies on employment and would, at its next session, discuss the ways in which individuals could make use of emerging technologies. The Commission was also a forum in which representatives of civil society, the academic and technical communities, business, and international organizations could share information and lessons learned regarding the effectiveness of various science, technology and innovation policies. Lastly, the concept of resilience itself must be decoded, through an analysis of causes rather than consequences. For the good of humanity, and in the spirit of the 2030 Agenda, resilience must not be built in response to poverty, vulnerability, marginalization or people's lack of visibility.

33. **Mr. Dewar Viscarra** (Mexico) said that his delegation, which had co-sponsored General Assembly resolution 72/242 concerning the impact of rapid technological change on the achievement of the Sustainable Development Goals, attached great importance to the panel discussion. The nexus between development and such humanitarian issues as natural disasters must be addressed without politicization. Partnerships were essential to the 2030 Agenda, which could not be implemented by Governments without the involvement of corporations, including small companies.

34. **Ms. Hamdouni** (Morocco) requested further information regarding the ways in which a culture of resilience to natural disasters and a spirit of prevention were promoted in Mexico, in particular through new technologies; and the role of the United Nations Forum on Forests, whose thirteenth session would be held in May 2018 in New York, in raising awareness of the role of forests in building resilience.

35. **Mr. Valdés González** (Director General for Civil Protection, National Centre for Disaster Prevention, Mexico) said that the worsening of the annual hurricane season in Mexico helped remind people of the need for disaster prevention. To ensure that earthquake prevention was effective, it must be conducted in the native languages of the country's 7.5 million indigenous people. His Government focused on prevention not only in the long term, up to 2030, but also in preparing for the 2018 hurricane season.

36. **Mr. Ahmad** (Director a.i. of the United Nations Environment Programme (UNEP) New York Office) said that awareness of the role of forests in resilience would mainly be raised through Member States, which were essential to building bridges between agencies and forming partnerships. Forestry and biodiversity were on the programme of work of UNEP, which had sent experts in the area to the Forum. The Programme worked in partnership with the Food and Agriculture Organization of the United Nations on the mechanism for reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries, and cooperated with the United Nations Framework Convention on Climate Change process.

37. **Mr. Zimmerman** (Co-founder of Coolar), said that, in building resilience and sustainability, the efficient use of data and of such resources as energy, food and medicine was more important than new inventions.

38. **Mr. Moutenot** (Co-founder of Upstream) said that he was hopeful that technologists would switch careers from financial and social networking companies to areas in which they would make a lasting impact in resilience and sustainability. He undertook to employ a dozen engineers and technologists in 2018.

39. **Mr. Ahmad** (Director a.i. of the United Nations Environment Programme (UNEP) New York Office) said that UNEP was committed to forging inclusive partnerships with the private sector in the field of science, innovation and technologies to implement the 2030 Agenda.

40. **Ms. Sindi** (Founder and President of the Institute for Imagination and Ingenuity and member of the 10-Member Group to Support the Technology Facilitation Mechanism (2016–2017)) said that the Islamic Development Bank was committed to upholding the right to live in dignity and prosperity. It provided financial and legal help, and support in entrepreneurship and intellectual property protection, without discrimination on the grounds of religion or nationality, to start-ups and partnerships in science, technology and innovation. The Bank was committed to alleviating poverty and providing education and medicine for all in the developing world. The Transform fund was intended to create an environment in which talent could flourish to support the implementation of the Sustainable Development Goals.

41. **Mr. Valdés González** (Director General for Civil Protection, National Centre for Disaster Prevention, Mexico) said that his Government, which had already been brought close to citizens by natural disasters, undertook to bring out the best in people at times other than disasters, including by raising awareness of United Nations work in disaster prevention.

42. **Ms. Triyanti** (representative of the Young Scientists in the Science and Technology Advisory Group of the United Nations Office for Disaster Risk Reduction for 2017 to 2018 and panellist in session 2 of the segment) said that scientific research was essential to the establishment of projections based on multi-risk data to prepare the world for the disaster-related effects of environmental change.

43. **Mr. Huffines** (representative of CIVICUS, World Alliance for Citizen Participation, at the United Nations, New York) said that, in adopting the 2030 Agenda, Member States had resolved to end poverty and hunger, combat inequality, build peaceful, just and inclusive societies, protect human rights, promote gender equality and the empowerment of women and girls, protect the planet and its natural resources, and create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities. Climate change, conflicts and refugee emergencies did not respect national borders and could be resolved only through cooperation at the United Nations among Governments, international institutions, business and citizens.

Closing of the segment

44. **The President** said that the deliberations at the integration segment had helped maintain the momentum for the implementation of the 2030 Agenda. Participants had emphasized the multidimensional nature of the concept of resilience, which had originated in the natural sciences and was now prevalent in psychology, sociology, economics, information technology, disaster risk reduction and other disciplines. Many countries and cities had developed resilience strategies, and the sharing of experience by Governments, local authorities, civil society organizations and private companies was invaluable. Community engagement was the key to national resilience, and social cohesion and participation, inclusive decision-making and trust among actors were essential to such engagement. Technology could be effective in building resilience, but must be managed properly to avoid the creation of new vulnerabilities. The success of resilience strategies depended on the involvement of all citizens; in an interconnected world, awareness regarding global challenges must be raised through the provision of evidence-based information and through education and training. The international community must make every effort to create resilient and innovative societies, which were essential to growth and change.

The meeting rose at 5.30 p.m.